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while others in this stronger light retain their pure white color."¹¹ And in a foot note in this connection he cites Hoffman as authority for a change of color in the flowers of valerian (Baldrien in German) from flesh color in Germany to dark-red in Norway.

It seems very probable, therefore, notwithstanding this diversity of views, that bright skies and a continued strong illumination, whether regional or seasonal, may have the influence which was marked enough to be observed in Minnesota, a conclusion reached before making special inquiry to see if it accorded with facts observed by others. And while the inquiry has not in every way proved satisfactory, there yet is left a strong residuum of belief that the cause originally assigned is not without a basis for its support. So, in the experiments it was seen that the yellow colors were but little affected by varied conditions of light, as was the case in the flowers of the Minnesota plants. The subject offers an inviting field of inquiry to those who may be located so as to observe the plants of the northwest in this respect for a sufficient time, and thus reach a more trustworthy conclusion based on a longer series of observations.

Englewood P. O., Chicago, Ill.

Notes on some phanerogams of Central Minnesota.

CONWAY MACMILLAN.

The following is a partial record of observations made during August, 1890, by the writer, who, in company with Mr. E. P. Sheldon, of the University of Minnesota, studied the flora about Gull lake, Cass Co., and in the immediate vicinity of Brainerd, Crow Wing Co., Minn.

Brasenia peltata Pursh.—This plant is occasionally found in the northern part of the state, extending southward to Minneapolis, but is always rare or local. It grows luxuriantly in Irving Chase lake, twelve miles west of Gull lake, and, in a dozen other small forest lakes of the immediate neighborhood, is the most prominent plant. Apparently it excludes from these waters the white water lily (*Nymphaea odorata*) and tends to drive out the common pond lily (*Nuphar advena*).

¹¹ l. c. p. 50.

Cleome integrifolia Torr. & Gray.—In the Catalogue of the Flora of Minnesota, by Warren Upham, 1884, this species is noted as “an immigrant from the plains west of Minnesota,” and is reported only from the southwestern corner of the state. It is a common plant in the neighborhood of White Sand lake, three miles west of Brainerd, where it appears to have been introduced first along the line of the Northern Pacific Railway.

Arenaria patula Michx.—Never before reported from Minnesota. Undoubted specimens of this plant were collected on the north shore of White Sand lake, where, however, it is by no means abundant. The range for *A. patula* given in the Gray's Manual for 1890, is “S. W. Va. to Ky., Ill., Kan. and southward.” Its presence, therefore, in Cass county, Minnesota, is somewhat remarkable. It does not have the appearance of a recent introduction.

Erodium cicutarium L'Her. — Introduced, infrequent. Reported hitherto only from Minneapolis, but found growing rather abundantly along Brainerd roadsides and in ill-kept dooryards.

Ceanothus ovatus Desf.—Hitherto noted only in southern and southeastern Minnesota. Very abundant in the pine barrens north of Brainerd. *C. Americanus*, noted by Upham as abundant in the upper Mississippi valley, was not seen by us on this trip.

Lespedeza capitata Michx.—Noted by Upham as “extending north at least to Cass county.” Very common around Gull lake; noticed on all sides, but more abundant on the southeast shore.

Myriophyllum ambiguum Nutt., var. *limosum* Torr.—This plant is new to the Minnesota flora. It was found rooting in the mud about Irving Chase lake, Cass county, and near the water line of other contiguous forest lakes. The plants collected by us all varied from the type of the variety as described by Torrey, in that, so far as observed, the leaves were pinnately divided into about six or seven very small succulent leaflets. No leaves were seen which could be called either “linear, incised, toothed or entire.” Otherwise the correspondence was exact and the Irving Chase lake plants are probably but a local variation. The var. *capillaceum* Torr. & Gray, was not seen.

Liatris scariosa Willd., *L. cylindracea* Michx., and *L. pycnostachya* Michx.—In the Upham catalogue *L. scariosa* is noted as the “most abundant species southwestward.” On the prairies south of the Minnesota river between New

Ulm and Granite Falls, however, it is apparently less common than *L. pycnostachya*, while in the vicinity of Gull lake and Brainerd it is exceedingly abundant in the pine barrens where *L. pycnostachya* is rare. *L. cylindracea* occurs near Brainerd, but only two typical plants were found. In this region almost every individual of *L. cylindracea* presents a most remarkable divergence from the type and it seems probable that this pine-barren form is of varietal rank. In accordance with such belief I present the following description:

Liatris cylindracea Michx., var. *SOLITARIA* (n. v.).—Differs from the type of the species in having a bushy stem 6 to 12 inches high, heads somewhat larger, never spiked, but solitary, terminal, erect or nodding.

This remarkable form of *L. cylindracea* has much more the aspect of a pink than of a blazing star. It has been seen by us only in the pine-barrens around Brainerd. In the Upham catalogue I find this note under *L. scariosa*: "A remarkable form of this species bearing the heads at the end of leafy ascending branches has been found in a bog near Mankato, by Mr. Leiberg." This may refer to the form just described, but probably does not, for the mucronate involucral scales of *L. cylindracea* would scarcely permit of confounding it with *L. scariosa*.

Grindelia squarrosa Duval.—Hitherto reported only from the southwestern edge of the state. Found at Brainerd in the pine-barrens. This plant is evidently traveling eastward at a rapid rate. It is remarkable to find it in the heart of the Minnesota forest.

Hieracium venosum L.—Reported so far only from the prairie region of the Red River valley, but abundant in the pine-barrens about Brainerd and in damp forest opening near Gull lake.

Monotropa Hypopitys L.—Mentioned in the Upham catalogue only from the region north of Lake Superior and from the Dalles of the St. Croix. It occurs rather abundantly in the white pine forests about Irving Chase lake. *M. uniflora* was not seen.

Plantago Rugelii Decaisne.—Very abundant in a bog near the Brainerd cemetery.

Utricularia gibba L.—Never before reported from Minn. Found growing in the mud at the waters' edge in Irving Chase lake. A foot or two from shore *U. intermedia* was noted. Both species were smaller than the average, and the peduncles were commonly but one-flowered.

Gerardia purpurea L., var. *paupercula* Gray.—This very variable species was abundant in the grassy beach of Irving Chase lake where it occurred together with *Lobelia Kalmii* and *L. syphilitica*. The *Gerardia* presented constantly an unusually colored corolla. The general hue was light rose purple, but the interior of the upper lip was blotched with dark crimson and orange, while both lips were slightly bearded.

Spiranthes Romanzoffiana Chamisso.—A rare plant in Minnesota. Found in a Brainerd bog, associated with *Habenaria hyperborea*, *Chelone glabra* and *Campanula aparinoides*.

A great variety of sedges was noted in the forest-lake region west of Gull lake. Almost every pond has some form growing abundantly along its shores which is sparingly represented at neighboring ponds or entirely absent. Of these, however, the study is incomplete as yet.

Minneapolis, Minn.

Station botanists at Champaign.

BYRON D. HALSTED, SECRETARY.

The station botanists were not out in full force at the Champaign meeting of the Association of Agricultural Colleges and Experiment Stations, but there was no lack of subjects to consider or topics to discuss; in fact, the time assigned to the meetings of the section was all too short, and some of the papers sent were unread and several others passed without the discussion that otherwise would have followed. It may be said in passing, that the sections made their lack of time known and as a result another full day for the station workers has been added to the next annual meeting. This will relieve matters greatly and make these meetings more than ever valuable to the station botanists.

Dr. J. C. Arthur was the first upon the programme with a paper upon "Reference books, how to use and obtain them." The importance of looking up any proposed subject for investigation was emphasized, for it often happens that a point thought to be new is in reality an old one. In preparing a bulletin it is sometimes best to treat it historically, the citations being given in small type foot notes. These notes, while they occupy small space and do not inconvenience the general reader, are of great service to all who desire to pur-